ably long, as also the antennæ. These are not new formations, but simply modifications apparently, by use or disuse of organs present in the other species. The aberrant myriopod and Stagobius are paralleled by the blind fish, an animal so difficult to classify, and so evidently adapted for its abode in endless darkness. And as an additional proof of the view here taken that these cave animals are modified from more or less allied species existing outside of the caves, we have the case of the crawfish, whose eyes (like those of the mole), are larger in the young than in the adult, indicating its descent from a species endowed with the faculty of sight, while in the adult the appendages are modified as tactile organs so as to make up for its loss of eyesight, in order that it may still take its prey.

We thus see that these cave animals are modified in various ways, some being blind, others very hairy, others with long appendages. All are not modified in the same way in homologous organs ; another argument in proof of their descent from ancestors whose habits varied as those of their out-of-door allies do at present. Had they been specially created for subterranean life, we should have expected a much greater uniformity in the organs adapting them to a cave life than we actually find to be the case.

Another fact of interest in this connection is the circumstance that these cave species breed slowly, being remarkably poor in individuals ; they are nearly all, except the wingless grasshoppers, extremely rare. Did they breed as numerously as their allies in the outer world, the whole race would probably starve, as the supply of food even for those which do live is wonderfully limited.

It is now known that animals inhabiting the abysses of the sea are often highly coloured: light must penetrate there, for we know that were the darkness total they would be colourless like the cave insects.

In view of the many important questions which arise in relation to cave animals, and which have been too imperfectly discussed here, we trust naturalists the world over will be led to explore caves with new zeal, and record their discoveries with minuteness, and the greatest possible regard to exactness. The caves of the West Indian Islands should first of all be carefully explored. Also those of Brazil, those of the East Indies, and of Africa, while fresh and more extended explorations of our own Mammoth Cave should be made, perhaps by a commission acting under Government or State authority, in order that the most ample facilities may be afforded by the parties owning the cave.

A. S. PACKARD

PROPOSED GRAND AQUARIUM FOR MANCHESTER

THE *Manchester Examiner and Times* of April 2 gives a long account of a Grand Marine Aquarium which it is proposed to build at Manchester, and which shows the interest which is felt in scientific studies in the northern capital. From this article we have made the following extracts, as showing the complete scale upon which everything is proposed to be carried out.

The funds are to be raised by a company started under the superintendence of a number of gentlemen resident in the city who are interested in marine zoology, and desire to promote scientific education in all its branches. The building will contain all the recent improvements shown to be necessary at the Crystal Palace and Brighton Aquaria, and will be rectangular in shape, 120 ft. long and 70 ft. wide. This space will be divided into two side galleries, each 120 ft. long and 15 ft. wide, separated from the central saloon by a light screen. Running along one side of each of these galleries will be a series of tanks, about eighty in number, forty in each gallery, varying in capacity from 300 to 3,000 gallons, and the roofs will be so arranged that the light will pass through the water at an angle of about forty-five degrees to the spectators, thus rendering distinctly visible the living inhabitants and plants contained in the grotto-like tanks. The grand saloon will be also 120 ft. long by 40 ft. wide, supporting on light iron columns an open panelled roof. All the windows will be so arranged as to admit only the exact quantity of light required, as it is found that an excess of light acts upon the higher marine plants and animals in a manner directly contrary to its action upon terrestrial life. It blanches them in a similar manner as ordinary plants are blanched by being earthed up. The most brilliant coloured marine plants are those which live in comparative darkness. The grand saloon will contain two tanks—the largest that have yet been constructed—one at each end of the room, 30 ft. long, 10 ft. wide, and 8 ft. deep, capable of containing each 15,000 gallons of water, and in which the largest specimens of fish found in the British seas will find ample room to display themselves. These tanks will have also a polished plate-glass frontage of great strength, through which the animals can be well seen.

In order to accommodate the inhabitants of what is called the littoral zone round our coasts, a series of shallow tanks, varying in capacity from 20 to 200 gallons, will be erected, in which the animals can be seen either from the surface of the water or through the transparent fronts, and by an ingenious contrivance the supply of water will be so regulated as to afford in every respect tidal currents. Besides these there will be other tanks at the back of the exhibition tanks for reserve stocks, and in the basement cisterns to hold a reserve supply of 60,000 gallons of sea water.

Such are the contemplated arrangements for marine, animal, and vegetable life ; but in addition to these the inhabitants of our brooks, ponds, &c., will not be forgotten, and a series of table aquaria will be provided : while the larger inhabitants of our rivers and lakes will swim in an ever-flowing river and pond supplied by fountains, and placed in the centre of the grand saloon. Such is a brief description of the proposed Manchester Grand Aquarium, which, it is hoped, will both be a success in a scientific, as well as a pecuniary point of view. Mr. B. Hooper, a well-known naturalist, has been engaged as curator of the Aquarium. A site for the Aquarium has been obtained in the vicinity of the Alexandra Park, and it is proposed to open it on Saturdays and Mondays at an admission fee of 1*d.* ; on Tuesdays, Wednesdays, and Thursdays, at 6*d.* ; and on Friday, which will be a students' day, at 1*s.*

NOTES

THE following lectures in Natural Sciences will be delivered in Trinity, St. John's, and Sidney Sussex Colleges, Cambridge, during Easter Term, 1872 :—"On Light and Heat" (for the natural sciences tripos), by Mr. Trotter, Trinity College ; Mondays, Wednesdays, and Fridays, at 10, commencing Wednesday, April 17. "On Heat" (for the special examination for the ordinary degree), by Mr. Trotter, Trinity College ; Tuesdays, Thursdays, Saturdays, at 11, commencing Tuesday, April 16. "On Chemistry," by Mr. Main, St. John's College ; Mondays, Wednesdays, Fridays, at 12, in St. John's College Laboratory, commencing Friday, April 19. Instruction in Practical Chemistry will also be given. Attendance on these lectures is recognised by the University for the certificate required by medical students previous to admission for the examination for the degree of M.B. "On Palæontology" (the Mollusca), by Mr. Bonney, St. John's College ; Wednesdays and Fridays, at 9, commencing Friday, April 19. "On Geology" (for the natural sciences tripos. Stratigraphical Geology), by Mr. Bonney, St. John's College ; Tuesdays, Thursdays, and Saturdays, at 10, commencing Thursday, April 18. There will be excursions every Saturday. "Elementary Geology" (for the special examination) ; Wednesdays and Fridays, at 11, commencing Friday, April 19. "On Botany," by Mr. Hicks, Sidney College; Mondays, Wednesdays at 1 P.M., and Fridays, at 12, beginning Monday, April 15. The lectures this term will be chiefly on Cryptogamic Botany, the movements of plants, and the principles of classification. "On Embryology," the Trinity Prælector in Physiology (Dr. M. Foster) will deliver a short course at the new museums, beginning Monday, April 22, at 11 o'clock. The Physiological Laboratory is open for practical instruction in Physiology to all those who have gone through the elementary course.

WE have to record this week the death of *facile princeps* the most eminent of vegetable physiologists, Prof. Hugo von Mohl, which took place on April 1 at Tübingen. Von Mohl was born at Stuttgart in 1805, and in 1835 was appointed Professor of Botany and director of the Botanic Garden at Tübingen, a position he has held ever since. Conjointly with Schlechtendal, and since his death with Prof. de Bary, formerly one of his pupils, he has been editor of the weekly "Botanische Zeitung" since its commencement in 1843. He was one of the foreign members of the Linnean Society, having been elected as long ago as 1837. Von Mohl has been a copious and most accurate writer on subjects connected with vegetable anatomy and physiology, of which he may be said to have laid the secure foundation in his early investigations of the true relations of cell-membrane and contents. Among his original observations we may especially mention his essay on the Structure of Endogens, published by von Martius in his "Historia Palmarum," and on the Stem-structure of Cycads in the "Vegetable Cell," which appeared in Rudolph Wagner's "Handwörterbuch;" on the Origin and Structure of Stomates; on Cuticle; on the Structure of Cell-membrane; on the Structure and Anatomical relations of Chlorophyll; on the Multiplication of Plant-cells by division, and numerous other essays collected in his "Vermischte Schriften."

ASTRONOMY has sustained a heavy loss in the death of M. P. A. E. Laugier, which took place at Paris on the 5th inst., in the 50th year of his age. M. Laugier was a member of the French Academy and of the "Bureau des Longitudes," and examiner to the naval school at Brest. He was a pupil of Arago, and the following account of his various researches is furnished to the *Révue Scientifique* by M. G. Rayet:—In 1841 he presented a memoir to the Academy on Solar Spots, and was the first to determine their proper motion. The discovery and calculation of a telescopic comet in 1842 won for the young astronomer the Lalande gold medal. At the request of Humboldt he was engaged for some years in the improvement of the construction of astronomical clocks. In 1853 he made an exact determination of the latitude of the Paris Observatory, estimating it at $48^\circ\ 50'\ 11''\cdot 19$, differing considerably from the earlier determination of Arago and Mathieu. In 1857 he published a catalogue of the declination of 140 stars, having previously issued one of 53 nebulæ. M. Laugier was associated with Arago in a number of his researches on the physics of the globe, and in his magnetic and photometric labours; and has for long made the observations on the declination and inclination of the magnet for the "Bureau des Longitudes." M. Rayet speaks of his death as a source of great grief to the Academy, which had formerly elected him president, and to his colleagues, by whom he was beloved for the moderation of his character, and his affable manners.

AT the meeting of the French Academy of Sciences on the 1st inst. the Abbé David and M. Ledieu were elected correspondents of the Section of Geography and Navigation, in the room of M. d'Abbadie, who has been elected a member of the Academy, and of the late Prince Demidoff.

THE Museums and Lecture Room Syndicate have presented their sixth Annual Report to the Senate of the University of Cambridge. It includes separate reports from Mr. J. W. Clark, superintendent of the Museum of Zoology and Comparative Anatomy, and from Profs. Humphry, Newton, Babington, Miller, Challis, Liveing, and Sedgwick. In response to an appeal from the venerable Prof. Sedgwick, the Woodwardian Museum has acquired during the past year (the purchase money having been raised by subscription) the very valuable collection of fossils made by Mr. Leckenby of Scarborough. Prof. Sedgwick considers the present geological collection of the University to be one of the noblest collections, as far as regards British geology, that exists in England, and for study and practical use, to be inferior to none existing in the island. In order to supply facilities for the practical study of Comparative Anatomy, and to supplement the lectures of Prof. Newton, Mr. J. W. Clark has commenced a class for practical work, for which, however, no sufficient accommodation is at present provided by the University. Mr. G. R. Crotch has been engaged for nearly the last twelvemonth in determining and arranging the extensive collections of insects, both British and exotic, contained in the Museum. The collection includes long series of those insects which were peculiar to certain localities in Cambridgeshire and the adjoining counties, and which, from increase of drainage in the fens and other causes, are either extinct or likely to become so in a few years.

THE discovery of two new planets is recorded. The elements of the first, No. 119, discovered by M. Paul Henry at Paris, are:—

April 9, 11^h, Paris M.T. R.A. $= 13^h\ 18^m\ 59^s$. D. $= -8^\circ\ 40'\ 23''$

The first position is approximate only. The horary movement is $-1^s\cdot 75$ R.A., $+ 25''$ declination. It is of the 11th magnitude. The second was discovered by M. Borelly, and has the following elements:—

April 10, $12^h\ 16^m\ 32^s$, Marseilles M.T. R.A. $12^h\ 0^m\ 55^s\cdot 38$.
Polar distance, $95^\circ\ 2'\ 44''\cdot 9$.
April 10, $13^h\ 14^m\ 36^s$, Marseilles M.T. R.A. $12^h\ 0^m\ 53^s\cdot 63$.
Polar distance, $95^\circ\ 2'\ 41''\cdot 4$.

It is between the 11th and 12th magnitude.

THE next lecture to the Crystal Palace School of Science will be delivered this evening by Dr. W. B. Carpenter on "Researches in the Deep Sea."

DR. LIEBREICH will deliver his lecture on "Turner and Mulready" at the London Institution, Finsbury Circus, on Thursday evening next, the 25th inst., at 7.30 P.M.

THE following paragraph, copied *verbatim et literatim* from an evening contemporary, is a striking comment on our remarks last week on "Newspaper Science:"—"M. Agassiz has been finding out some more curious creatures in the deep-sea dredgings near Rio. It would really seem that if we only go deep enough we shall eventually reach the beginning of all things. Dr. Carpenter found living at the bottom of the Atlantic crustaceans of the same kind as those whose bodies now lie in our chalk hills, only seeming slightly degenerated, as if the family had once 'seen better days.' And now Prof. Agassiz tells his friend Prof. Peircei, of Harvard, in a long letter published in the American papers, how at 500 fathoms down he has fished pectens, and also other creatures, who are henceforth to bear the fearful but doubtless honourable appellation of Tomocaris Peircei, which resemble nothing living, only fossils of some of the earliest formations. The Tomocaris, in particular, is strongly suspected of being—we blush to name it—no better than a Trilobite! We shall not disturb our readers by quoting all the array of terrible words—maxillipeds, pygidiums, phyllopods, and the like—with which Prof. Agassiz's letter bristles; nor his interesting controversy with Prof. Milne Edwards concerning the Simulus, which animal's 'cephalo thorax' is so remarkable that 'the function of chewing is devolved upon the legs.' We only advise our friends who may be intensely anxious about these points to consult his letter *in extenso.*" Is the author of "What is a Joule?" the special scientific correspondent of all the daily papers?

We learn from the *Journal of the Society of Arts* that King Victor Emmanuel has presented to the Geological Museum of the University of Rome a collection of Peruvian antiquities—silver vases, curious musical instruments, a coloured garment made from the bark of trees, and arrows and lances. The articles were discovered in a guano bed, and are antiques. The lances are notched, ornamented with feathers, and have wooden heads, showing that they were made before iron was used.

A report of the meeting of delegates of the French departmental learned societies, held on the 4th inst., under the presidency of M. Jules Simon, is given in *Les Mondes*. The following medals were awarded:—Gold: to Grenier, of Besançon, botanical researches; Grandidier, scientific travels in Madagascar; Houzeau, of Rouen, researches in ozone. Silver: to Boussinesq, of Gap, mathematical mechanics; Tourdes, of Strasbourg, legal medicine; Faivre, of Lyons, vegetable physiology; Fromontel, of Gray, palæontology; Reboul, of Besançon, chemistry; Cailletet, of Châtillon-sur-Seine, agricultural and industrial chemistry; Mazure, of Bar-le-Duc, agriculture; Chautard, of Nancy, meteorology; Coquelin, of Beauficel, meteorology; Crova, of Montpellier, physics; Raoult, of Grenoble, physics; Mussy, of Montluçon, a geological map of Ariége.

Prof. Hayden has applied to the Congress of the United States for a grant of 75,000 dols. for the purpose of continuing for another year his most important geological survey of the territories of the United States. He proposes making a thorough series of astronomical, topographical, meteorological, geological, and chemical observations, which cannot but be of the utmost value in developing the material resources of the country. The application has the cordial support of the Secretary of the Interior.

SCIENTIFIC INTELLIGENCE FROM AMERICA[*]

Major Powell has returned from the cañons of the Colorado, having left his party in the field in charge of Prof. Thompson. Since the party started in April last, it has passed through the cañons of Green River and the cañons of the Colorado to the mouth of the Paria, at the head of Marble Cañon. Here the Major left his boats for the winter, and he expects to return as soon as there is a favourable stage of water, and embark for the second trip through the Grand Cañon. On the way down the party explored the region to the west of the Green and Colorado, ſtracing the courses of the larger streams emptying into the two great rivers to their sources in the Wasatch Mountains and Sevier Plateau, and examined the geology of the great mesas and cliffs. Early in the winter a base-line 47,000 feet in length was measured on a meridian running south from Kanab, and the party is now engaged in extending a system of triangles along the cliffs and peaks among lateral cañons of the Colorado. During the past season the party has discovered many more ruins of the communal houses once occupied by the prehistoric people of that land. Many of these houses stood upon the cliffs overhanging the cañons, and many more are found in the valleys among the mountains to the west. Stone implements, pottery, basket-ware, and other articles were found buried in some of the ruins. The Major found a tribe of Utes on the Kaibab Plateau who still make stone arrow-heads and other stone implements, and he had an opportunity to observe the process of manufacturing such tools.—Mr. Joseph Sullivant, of Columbus, Ohio, a well-known naturalist, publishes an account in the *Ohio State Journal* of the capture of the *Bassaris astuta*, or ring-tailed cat of the Rio Grande region. It was taken in Fairfield County, Ohio, and was said to be accompanied by a second specimen. The occurrence of this animal so far north is very remarkable, and it may be a question whether it had not been brought from Mexico or California, and escaped from confinement. It is an animal very much sought after as a pet, being clean in its habits, and readily becoming very tame and affectionate; indeed, it would seem to be quite a desirable animal to domesticate and keep about the house as a protection against rats and mice. Some years ago a specimen of this same animal was brought into the Smithsonian Institution, having been captured in a hen-coop near the city. It was in capital condition and in full fur; but it had evidently escaped from captivity, as shown by the marks of the rubbing of a collar round the neck.—The greatest depth between the west end of Cuba and the coast of Yucatan found by the Coast Survey steamer *Bibb* is 1,164 fathoms, as reported to Prof. Peirce by Captain Robert Platt, commanding the surveying vessel. The lowest temperature observed is 39·5° F. at the bottom; surface, 81°; strongest current, two knots; direction, north. Dr. Stimpson reports the bottom from Cape San Antonio to Yucatan very barren of animal life. A few rare shells were found.—In a paper by Prof. Cope upon the *Pythonomorpha*, or Python-like fossil saurians of the cretaceous formation of Kansas, presented to the Academy of the American Philosophical Society of Philadelphia, he shows that America is the home of this group, four species only having been described from Europe. Forty-two North American species are already known, of which fifteen belong to the Greensand formation of New Jersey, seven to the Limestone region of Alabama, seventeen to the Chalk of Kansas, and three to other localities. Of the Kansas species six are described as new by Prof. Cope in the paper referred to.—A new fossil reptile, from the cretaceous strata of Kansas, has just been described by Prof Cope under the name of *Cynocercus incisus*. The peculiarity of this reptile consists in having the articular faces of the vertebræ deeply excavated above and below, so as to give them a transverse character. A new crocodilian from the same region was also described, under the name of *Hyposaurus webbii.*—Prof. Cope has shown, in a paper read to the American Philosophical Society, that the greater number of the fossil fishes of the cretaceous strata of Kansas belong to three families, namely, the *Saurodontidæ*, the *Pachyrhizodontidæ*, and the *Stratodontidæ*. Of the first family four genera and ten species are described in his paper, some of them (as those of the genus *Portheus*) being among the most formidable of marine fishes. Of the second family one genus and four species are introduced, and three genera and seven species of the third. The *Stratodus*, a genus of the *Stratodontidæ*, is provided with multitudes of minute shovel-headed teeth. He finds a great resemblance between this Kansas fauna and that of the English Chalk, no less than six of the eight Kansas genera having been found in the latter.—Some of our readers may remember the letter written by Prof. Agassiz to Prof. Peirce in December 1871, just before starting upon the Hassler expedition, in which he announced beforehand the general nature of the discoveries that he expected to make. His ability to make these predictions with any degree of certainty was much questioned by those who were not familiar with the method of research in natural history, and of the almost mathematical nature of the inferences to be derived from certain given premises. We now have a second letter addressed to Prof. Peirce, written at Pernambuco on Jan. 16, giving an account of experiences up to that date, which go far toward showing that the Professor really knew of what he was speaking in the first instance. Owing to various adverse influences, among them the necessity of hastening with all possible despatch to reach the Straits of Magellan at the earliest possible date, only four hauls of the dredge were made in water of any great depth, those being at depths of from 75 to 120 fathoms off Barbadoes. The results of these were in the highest degree satisfactory, however, "the extent and variety of material obtained being enough to occupy," in the Professor's words, "half a dozen competent zoologists for a whole year, if the specimens could be kept fresh for that length of time." As anticipated by the Professor in the letter referred to, the most interesting discoveries were certain forms of animals, the allies of which had previously been known in greater part or entirely as fossils of older formations. Among these may be mentioned a remarkable sponge, a crinoid very much like *Rhizocrinus*, a living *Pleurotomaria*, only three having been previously known, although a great many are described as fossil, &c. The crinoid, especially, is one of the very few living representatives of what was originally the prevailing character of

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[*] Communicated by the Scientific Editor of *Harper's Weekly*.